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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/170,835	10/13/1998	DUNMIN ZHENG	1-15	7202

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EXAMINER

HAROLD, JEFFEREY F

ART UNIT

PAPER NUMBER

2644

DATE MAILED: 08/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/170,835

Applicant(s)

ZHENG ET AL.

Examiner

Jefferey F. Harold

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1-2, 5-7 and 9-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al (United States Patent 5,138,664), hereinafter referenced as Kimura, in view of Saunders et al (United States Patent 6,078,672), hereinafter referenced as Saunders, further in view of Chen (6,256,383).

Regarding **claim 1**, Kimura discloses a noise reducing device. In addition, Kimura discloses a handset (81) comprising a noise reducing device, wherein:

the noise reducing device comprises a microphone (2) for picking up the external noise, which reads on claimed "reference microphone", and transfer means (15) and sound producing means (5), for generating a signal to cancel the ambient noise, as disclosed at column 7, line 42 through column 9, line 21 and exhibited in figures 7 and 9-10,

the transfer means (15) and sound producing means (5) is receivingly coupled to the microphone (2), and transmittingly coupled to a speaker unit (84) of the handset (81), as disclosed at column 7, line 42 through column 9, line 21 and exhibited in figures 7 and 9-10,

the noise reducing device is configured as a fixed feed forward noise-cancellation system, as exhibited in figures 7 and 10, however, Kimura fails to disclose a digital filter and wherein the digital filter is a non-adaptive IIR filter. However, the examiner maintains that it was well known in the art to provide a digital filter and wherein the digital filter is a non-adaptive IIR filter, as taught by Saunders.

In a similar field of endeavor Saunders discloses an adaptive personal active noise system. Regarding the digital filter, Saunders discloses wherein a feedforward controller is used to reduce the objectionable sound reaching the user's ear. Further it is an IIR digital filter and by design can be realized via analog hardware represented by a fixed design operational amplifier circuit, as disclosed at column 10, lines 6-48 and exhibited in figures 8 and 10.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kimura by specifically providing an IIR digital filter, as taught by Saunders, for the purpose of for generating a signal to cancel the ambient noise.

Regarding the non-adaptive IIR filter, Saunders discloses a fixed design digital IIR filter, as disclosed at column 10 lines 31-48 and exhibited in figure 8, however, Saunders fails to specify disclose a non-adaptive IIR filter. However, the examiner maintains that it was well known in the art to provide a non-adaptive IIR filter, as taught by Chen.

In a similar field of endeavor Chen discloses an IIR filter for long tail echo cancellation. In addition, Chen discloses a non-adaptive IIR filter system 40 as disclosed at column 8, line 59 through column 10, line 55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kimura and Saunders by specifically providing a non-adaptive IIR filter, as taught by Chen, for the purpose of eliminating the complexity and expense associated with the use of adaptive IIR filters, which also may exhibit stability problems.

Regarding **claim 2**, Kimura, Saunders, and Chen, the combination, discloses everything claimed as applied above (see claim 1), in addition, Kimura discloses wherein reference microphone (2) is enclosed in grip (81) (i.e., Handset), faces opposite of the user's ear, which reads on claimed "port opens through an external surface of the handset", as disclosed at column 7, lines 42-52 and exhibited in figure 9.

Regarding **claim 5**, Kimura, Saunders, and Chen, the combination, discloses everything claimed as applied above (see claim 1), in addition, Kimura discloses wherein:

the noise reducing device has a operating frequency range of up to 1.5 kHz, as disclosed at column 6, lines 14-28 and exhibited in figure 6,

the speaker unit (84) has a approximate transfer function F, as disclosed at column 8, lines 13-18,

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when the handset is in use, a transfer function P relates noise pressure at the user's ear to the ambient noise at the reference microphone, as disclosed at column 8, line 13 through column 9, line 63,

over the operating range the transfer means (15) and sound producing means (5) has a transfer function that can be derived as F/P .

Regarding **claim 6**, Kimura, Saunders, and Chen, the combination, discloses everything claimed as applied above (see claim 5), in addition, Kimura discloses wherein the weighting function (F/P) rolls off above 1.5kHz as exhibited in figure 4.

Regarding **claim 7**, Kimura, Saunders, and Chen, the combination, discloses everything claimed as applied above (see claim 5), in addition, Kimura discloses wherein the G is a feasible open loop gain for the noise reduction device if it is configured as a fixed feedback system instead of a feed-forward system: and over the operating range, the weighting function is $G/(1+G)$

Wherein P is the output, F is the transfer function, N is the ambient noise, and G is the gain, hence:

$$P = G e$$

$$e = (N - F)$$

$$e = N - (P * A(w))$$

$$P = G (N - (P * A(w)))$$

$$P = GN - GPA(w)$$

$$P (1 + GA(w)) = GN$$

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$$P = GN/(1 + GA(w))$$

$$P/N = G/(1 + GA(w))$$

If $A(w) = 1$, then $P/N = G/(1 + G)$.

Regarding **claims 9-18**, they are interpreted and thus rejected for the same reasons set forth above in claims 1-8. Since claims 9-18 disclose a method that corresponds to the apparatus disclosed in claims 1-8 above, they provide an inherent process for the implementation of the apparatus claims. Therefore they are interpreted and thus rejected for the reasons set forth above in the rejection of claims 1-8.

2. **Claims 3-4 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Saunders, further in view of Chen in view of well know prior art (MPEP 2144.03).

Regarding **claim 3-4** Kimura, Saunders and Chen, the combination disclose everything claimed, as applied above, (see claim 2), however, the combination fails to disclose minimal distances between the reference microphone and the speaker. However, the examiner takes official notice of the fact that it was well know in the art to provide minimal distances between the reference microphone and the speaker.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically providing minimal distances between the reference microphone and the speaker, for the purpose of providing the best noise sample for the noise reduction device with the minimal feedback between the microphone and the speaker.

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Regarding **claim 8**, Kimura, Saunders and Chen, the combination disclose everything claimed, as applied above, (see claim 5), however, the combination fails to disclose averaging over a population of users. However, the examiner takes official notice of the fact that it was well know in the art to provide averaging over a population of users.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically providing averaging, for the purpose of determining the characteristics of the non-adaptive filter.

Response to Arguments

3. Applicant's arguments filed May 9, 2002, have been fully considered but they are not persuasive.

Regarding applicant's argument concerning the combination of Kimura and Saunders reference, the examiner respectfully disagree, the Saunders reference is provided to demonstrate the concept of using a non-adaptive IIR filter for use in a feed-forward noise cancellation system.

Further, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Specifically, Kimura provides the telephonic handset with feed-forward noise cancellation. Combined with Saunders to demonstrate the use of an IIR-filter used in a

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active noise cancellation system. Then further combined with Chen to demonstrate the use of a non-adaptive IIR-filter. The combination as described above more than adequately provides support for the claimed invention.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kimura discloses a fixed feed-forward noise cancellation with a transfer means. It was well known to use adaptive and non-adaptive filters as a transfer means. Saunders provides such technology as cited in the above rejection.

In response to applicant's argument that Chen is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Chen is provided to teach the concept of using a non-adaptive IIR filter.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208

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USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding applicant's argument concerning it being well known to provide minimal distances between the reference microphone and speaker, and averaging over a population of user, the applicant failed to adequately traverse such a finding. To adequately traverse such a finding the applicant must specifically point out supposed errors in the examiner's action, which include stating why the noticed fact is not considered to be common knowledge or well-known art. Applicant fail to provide such a basis, hence examiner's assertion that it is common knowledge or well known in the art to provide minimal distances between the reference microphone and speaker, and averaging over a population of user, it is taken to be admitted prior art.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jefferey F. Harold whose telephone number is (703) 306-5836. The examiner can normally be reached on Monday-Friday 7:30am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



JFH
July 30, 2002



FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600